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10/692,706	10/23/2003	Theodore J. Copperthite	M-15261 US	9787

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MACPHERSON KWOK CHEN & HEID LLP  
2033 GATEWAY PLACE  
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SAN JOSE, CA 95110

EXAMINER
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STONER, KILEY SHAWN

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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01/23/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/692,706

Applicant(s)

COPPERTHITE ET AL.

Examiner

Kiley Stoner

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3,7 and 12-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3 and 15-17 is/are allowed.
- 6) ☒ Claim(s) 7, 12-14 and 18-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

The drawings were received on 10/26/07. These drawings are accepted.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 18, 19, 22, and 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Bechard et al. (US 4,028,798).**

Bechard et al. disclose a method of making electrical connections (attaching a wire/filament comprising a conductive material of copper or aluminum to a bonding area) to circuitry components such as printed circuit boards, in which the method includes providing a bond tool/head (in the form of pressurizing anvil 72 and/or ultrasonic vibrating wire embedding tool 73 applied perpendicular to the bonding area – column 6, lines 34-68; column 7, lines 1-15; and Figures 5-10); forming a groove (defined by the circumference of the wire/filament upon final positioning) in the bonding area via embedding the wire into plastic that is deformed upon heating (with a single pass) by the anvil 72 and/or ultrasonic tool 73, thus placing the wire in the groove and

enclosing the groove upon final positioning of the wire (abstract; column 1, lines 56-68; column 2, lines 1-59; column 6, lines 11-68; column 7, lines 1-68; column 8, lines 1-13; and Figures 5-10). It is the examiner's position that the process of Bechard et al. inherently meets the amended limitation of "forcing bond material around the wire to close the groove around the wire in a pre-determined shape".

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 7 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deubzer et al. (US 4,781,319) in view of Benson et al. (US 3,747,198).**

Deubzer et al. disclose a bonding head that includes two clamping portions between the bonding head and a rotatable spool that contains wire, in which the bonding head assembly 10 includes a bonding tool 18 connected to an ultrasonic transducer 16, in which the bonding tool 18 includes a groove portion 84; a wire spool 22 containing wire 20 thereon (Figures 7 and 8); a dancer arm assembly 34 comprising an arm and a pulley at the end of the arm (see Figure 6), such that the wire is laid out from the spool and along the pulley within the groove of the pulley for smoother wire

guidance therein, and one of the clamping portions (as discussed in the portions that follow) is located between the pulley and the bonding tool 18; a first clamping portion (adjustable guide 56 with adjustment means 58 in Figure 1) that applies a clamping force on wire 20, such that the first clamping portion includes a first (fixed) clamp arm having curved first and second portions (defining the wire aperture), with the first portion (on the left side of Figure 1) being closer to the wire spool 22 than the second portion (on the right side of Figure 1); and a second clamping portion in the form of an opposing (in terms of applying a second clamping force of wire 20) and moveable second clamp arm (wire clamp 24) having curved first and second portions (exterior tapered surfaces adjacent jaws 26 of wire clamp 24 with one portion being closer to the wire spool 22 than the other portion – column 4, lines 48-58; and Figure 1), such that the opening formed in adjustable guide 56 is wider than the gripping region at its narrowest portion (abstract; column 1, lines 48-68; column 2, lines 1-56; column 3, lines 28-68; column 4, lines 1-58; column 5, lines 22-68; column 6, lines 1-40; and Figures 1 and 6-8).

Deubzer et al. do not disclose the use of both a grooving section and a staking section.

However, Benson et al. disclose a bond tool/head for use in wedge bonding of gold wire to cermet substrates, in which the bond tool/head (bonding wedge 30) includes a working tip 32 defined by two tapered end sections that include a shallow elongated groove 34 (operable as a grooving section) operable to form a groove in the bond upon lowering of the bonding wedge 30, and wire guide means 42 (operable as a staking section) to facilitate seating of the wire 38 in groove 34, such that the use of both a grooving section and a staking section is advantageous for obtaining reliably

strong bonds due to elongated contact area of the wire with the cermet substrate during bonding (abstract; column 1, lines 5-9; column 2, lines 52-68; column 3, lines 14-68; column 4, lines 1-39; and Figure).

The newly added limitation "and the staking portion closes the groove the wire" is intended use and does not structurally limit the claimed apparatus. Thus, Benson et al. meets the limitation of the staking portion.

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the bonding head that includes two clamping portions between the bonding head and a rotatable spool that contains wire, as disclosed by Deubzer et al., by using the bond tool/head that has both a grooving section and a staking section, as taught by Benson et al., in order to facilitate seating of the wire in the groove, thus obtaining reliably strong bonds due to elongated contact area of the wire with the cermet substrate during bonding (Benson et al.; abstract; column 2, lines 52-58; and column 3, lines 29-52).

**Claims 20, 21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bechard et al. (US 4,028,798) as applied to claim 18, and further in view of Elwood et al. (US 5,217,154).**

Bechard et al. do not specifically disclose that the pressing portion of the bonding tool/head includes either a grooving portion or a staking portion with an inverted V shape.

However, Elwood et al. disclose a semiconductor bonding tool that is operable for transmitting ultrasonic energy, in which the bonding tool 1 includes an aperture 9 (serving as a guide portion) that further includes aperture opening 11 and aperture outlet 13, and either a semicircular or inverted V-shaped groove 7 (operable as either a grooving portion or a staking portion, respectively) at the tip of the bonding tool for retaining a wire/ribbon 15 to be welded therein (abstract; column 1, lines 9-14; column 2, lines 36-68; column 3, lines 12-46; column 4, lines 1-2; and Figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the method of making electrical connections that includes providing a bond tool/head, as disclosed by Bechard et al., by using the pressing portion of the bonding tool/head that includes a grooving portion or a staking portion with an inverted V shape, as taught by Elwood et al., in order to retain a wire/ribbon to be welded therein (Elwood et al.; column 3, lines 14-18).

***Allowable Subject Matter***

Claims 1, 3 and 15-17 are allowed.

***Response to Arguments***

Applicant's arguments filed 10/26/07 have been fully considered but they are not persuasive.

The applicant argues that Bechard et al. does not force bond material around the wire nor does it close the groove in a predetermined shape. It is the examiner's position

that the process of Bechard et al. inherently meets the amended limitation of "forcing bond material around the wire to close the groove around the wire in a pre-determined shape". As shown in the figures of Bechard et al., the embedding process forces the material to flow around the wire. Additionally, the flow of material during the embedding process at least partially closes the groove. Furthermore, since Bechard et al. is using a tool with a similar shape in Figures 5-7 and 9-10, it is the examiner's position that there will be a high degree of reproducibility when performing the embedding process. Thus, the bond material is formed around the wire in a predetermined shape. It should be noted that claim 18 does not require a staking portion to forcibly push the material around the wire to close the groove.

The applicant argues that neither Deubzer and Benson either alone or in combination, teach or suggest "the grooving section forms a groove in the bond and the staking portion closes the groove over the wire", as recited by claim 7. The newly added limitation "and the staking portion closes the groove the wire" is intended use and does not structurally limit the claimed apparatus. Thus, Benson et al. meets the limitation of the staking portion.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is 571-272-1183. The examiner can normally be reached Monday-Thursday (9:30 a.m. to 8:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jonathan Johnson can be reached on 571-272-1177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 1/17/08

Kiley Stoner

Primary Examiner A.U. 1793